MULTIBELT® Single-Idler Belt Weighers

- Continuous bulk solids measurement in belt conveyor systems
- Suitable for flow rates up to 15,000 t/h
- Accuracy up to ±0.5%
- Also legal-for-trade-version
- Simple and quick installation
- Type BEM – designed modularly, suitable for any belt width
- Types BEP/BED – weighing platforms, suitable for IEC belt widths
- Suitable for use in ATEX explosion-zones

**Application**

Single-Idler Belt Weighers are used for continuous acquisition of flow rates and totalized amounts. They are especially designed for integration into continuously operating belt conveyors enabling accuracies of up to ±0.5% to be achieved. They can be employed for a whole variety of tasks:

- Throughput and consumption measurement in production plants
- Accountability of stored and retrieved amounts
- Load limit alarm
- Batching, in load-out stations
- Legal-for-trade weighing
- Prefeeder control.

Their rugged design ensures a high degree of reliability and availability.

We have the right Belt Weigher for every Belt Conveyor. For Multi-Idler Belt Weighers designed for higher accuracies, see separate Spec Sheet BV-D2050.

**Construction**

The standard single-idler belt weigher comprises:

- Weighing module or platform for accommodating user’s idler set
- Overload-protected load cell(s) with high degree of protection
- Cable junction box for connection of sensors, and
- All fixing elements required for mounting.

For speed measurement, various speed transducers e.g. friction wheel tachometers, are available as options.

**Operating Principle**

Belt Weighers are used to measure continuous material flows of varying amounts.

Load cells acquire the weight of load on particular belt sections. A speed transducer measures the belt speed.

The product of these two variables is the current flow rate. Integration of flow rate determines the totalized amount of material.

If belt weighers are not equipped with speed measurement system, belt speed is not acquired. In the cases, weighing electronics use the constant speed value set by parameter.

However, this method can adversely affect the accuracy.
Dimensions [mm]

Single-Idler Belt Weigher BEM

Effective platform length

800 ≤ L ≤ 1250

Single-Idler Belt Weigher BEP

Effective platform length

800 ≤ L ≤ 1250

Single-Idler Belt Weigher BED

L ≤ 1000

Wirksame Brückenlänge

Option

Effective platform length

800 ≤ L ≤ 1250

Min 50 / Max 90

Min 100 / Max 150

800 ≤ L ≤ 1250

≤ ≤ 800 ≤ L ≤ 1250

≤ ≤ 800 ≤ L ≤ 1250

≤ ≤ 800 ≤ L ≤ 1250

Min 50 / Max 90

Min 100 / Max 100

200 - 300

824.5

Option
### Dimensions [mm]

<table>
<thead>
<tr>
<th>MULTIBELT</th>
<th>Dimensions [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BEM</strong></td>
<td></td>
</tr>
<tr>
<td>Measure B</td>
<td>Belt width 400 500 650 800 1000 1200 1400</td>
</tr>
<tr>
<td><strong>BEP</strong></td>
<td></td>
</tr>
<tr>
<td>Measure A</td>
<td>700 800 950 1150 1350 1600 1800</td>
</tr>
<tr>
<td>Measure B</td>
<td>Belt width 400 500 650 800 1000 1200 1400</td>
</tr>
<tr>
<td>Measure C</td>
<td>440 440 440 740 740 740 740</td>
</tr>
<tr>
<td><strong>BED</strong></td>
<td></td>
</tr>
<tr>
<td>Measure A</td>
<td>2050 2250 2500</td>
</tr>
<tr>
<td>Measure B</td>
<td>Belt width 1600 1800 2000</td>
</tr>
</tbody>
</table>

### Technical Data

<table>
<thead>
<tr>
<th>MULTIBELT</th>
<th>Single-Idler Belt Weighers</th>
<th>Accuracy</th>
<th>Flow rate</th>
<th>Weight</th>
<th>Belt Speed</th>
<th>Belt Rise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BEM</strong></td>
<td></td>
<td>±1,0 % of nominal flow rate</td>
<td>to ca. 4.000 t/h</td>
<td>≈ 60 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BEP</strong></td>
<td></td>
<td>±0,5 % of nominal flow rate</td>
<td>to ca. 6.000 t/h</td>
<td>≈ 100 kg</td>
<td>to ca. 6 m/s</td>
<td>~ 20° (No relative material movement)</td>
</tr>
<tr>
<td><strong>BED</strong></td>
<td></td>
<td>±0,5 % of nominal flow rate</td>
<td>to ca. 15.000 t/h</td>
<td>≈ 300 kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Accuracy

Specified accuracies refer either to nominal (maximum) flow rate or to the corresponding actual flow rate in the range of 20 to 100 %.

Specified accuracies assume that the variant is installed in a suitable belt conveyor and that the measuring station is installed and calibrated in accordance with our installation and calibration instructions.

For optimum planning-in of your belt weigher(s), see Spec Sheet BVR2220 ‘Recommendations for ensure proper functioning and high accuracy’.

### Special Requirements

Should you have special requirements, e.g.:
- Legal-for-trade variants
- Belt speed out of specified range
- Meter for varying belt angle
- Prefeeder control
- Flow rates exceeding 15,000 t/h
- Higher accuracies
- Special belt widths
- Special belt conveyors,
please let us know.

### Ordering Data

For us to be able to handle your order smoothly and quickly, please let us have the data below in addition to the ordering number:

- Belt width [mm]
- Flow rate [t/h]
- Belt rise [“]
- Belt speed [m/s]
- Accuracy [%]
- Nominal flow rate
- Actual flow rate
### Single-Idler Belt Weigher Variants

<table>
<thead>
<tr>
<th>Variant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM 400 - 1400</td>
<td>Belt weigher of modular design, belt widths from 400 - 1400 mm</td>
</tr>
<tr>
<td>BEP 400 - 1400</td>
<td>Belt weigher with weighing platform, IEC-belt widths from 400 - 1400 mm</td>
</tr>
<tr>
<td>BED 1600 - 2000</td>
<td>Belt weigher with weighing platform, IEC-belt widths from 1600 - 2000 mm</td>
</tr>
</tbody>
</table>

### Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGA 24 A</td>
<td>Speed measurement system, Namur switch with perforated disc</td>
</tr>
<tr>
<td>FGA 20 RSLE</td>
<td>Speed measurement system for belt speeds up to 3.5 m/s; friction wheel with rocker and support</td>
</tr>
<tr>
<td>FGA 30 R2</td>
<td>Speed measurement system for belt speeds up to 3.5 m/s; friction wheel, enclosed casing, rocker and support</td>
</tr>
<tr>
<td>FGA 30 R2 K</td>
<td>Speed measurement system for belt speeds from 3.5 m/s onward, with coupling for connection to shaft end</td>
</tr>
<tr>
<td>FGA 53 K</td>
<td>Speed measurement system for belt speeds from 0.1 m/s onward, with coupling for connection to shaft end</td>
</tr>
</tbody>
</table>

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MULTIBELT® Multi-Idler Belt Weighers

- Continuous bulk solids measurement in belt conveyor systems
- Suitable for flow rates up to 20,000 t/h
- Accuracy up to ±0.25%
- Also legal-for-trade-version
- Suitable for IEC belt widths
- Suitable for use in ATEX explosion-zones

Application
Multi-Idler Belt Weighers are used for continuous acquisition of flow rates and totalized amounts. They are especially designed for integration into continuously operating belt conveyors and enable accuracies of up to ±0.25% to be achieved. They can be employed for a whole variety of tasks:
- Throughput and consumption measurement in production plants
- Accountability of stored and retrieved amounts
- Load limit alarm
- Batching, in load-out stations
- Legal-for-trade weighing
- Prefeeder control.

Their rugged design ensures a high degree of reliability and availability.

Our product range is as varied as the demands of our customers. For Single-Idler Belt Weighers, see separate Spec Sheet BV-D 2049.

Construction
The standard Multi-Idler belt weigher comprises:
- Weighing platform for accommodating user’s idler sets
- Overload-protected load cell(s) with high degree of protection
- Cable junction box for connection of sensors, and
- All fixing elements required for mounting.

For speed measurement, various speed transducers e.g. friction wheel tachometers, are available as options.

Operating Principle
Belt Weighers are used to acquire continuous material flows of varying amounts.

Load cells acquire the weight of load on particular belt sections. The longer the belt section is, the less the measuring result is affected by external influences.

In addition to belt load acquired by load cells, belt speed is measured by a speed transducer.

The product of these two variables is the current flow rate. Integration of flow rate determines the totalized amount of material.
Dimensions [mm]

**Dual-Idler Belt Weigher BMP**

2 weighing stations arranged one after the other to achieve higher accuracies. (Weighing station dimensions are the same as those of the BMP weighing stations)

**Effective platform length**

**Dual-Idler Belt Weigher 2 BMP**

2 BMP weighing stations arranged side by side for belt widths from 1600 mm

**Multi-Idler Belt Weigher BMC**

Tension-compression tie-rod (500 mm long).

Load cell mount

4 m standard platform length. 6 m also possible.
## Technical Data

### MULTIBELT Multi-Idler Belt Weighers

<table>
<thead>
<tr>
<th></th>
<th>Accuracy</th>
<th>Flow rate</th>
<th>Weight</th>
<th>Belt Speed</th>
<th>Belt Rise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMP</strong></td>
<td>±0.25 % of nominal flow rate to ca. 15,000 t/h</td>
<td>≈ 200 kg to 1400 mm belt width</td>
<td>≈ 400 kg to 1600 mm belt width</td>
<td>to ca. 6 m/s (Preferential range)</td>
<td>~ 20° (No relative material movement)</td>
</tr>
<tr>
<td><strong>2 BMP</strong></td>
<td>±0.25 % of actual flow rate to ca. 15,000 t/h</td>
<td>≈ 400 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BMC</strong></td>
<td>±0.25 % of actual flow rate to ca. 20,000 t/h</td>
<td>≈ 380 - 480 kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Accuracy

Specified accuracies refer either to nominal (maximum) flow rate or to the corresponding actual flow rate in the range of 20 to 100 %.

The accuracy specified for the 2 BMP / BMC types refers to corresponding actual flow rate in the range of 30 to 100 %.

Specified accuracies assume that the variant is installed in a suitable belt conveyor and that the measuring station is installed and calibrated in accordance with our installation and calibration instructions.

For optimum planning-in of your belt weigher(s), see Spec Sheet BVR2220 ‘Recommendations for ensure proper functioning and high accuracy’.

### Special Requirements

Should you have special requirements, e.g.
- Legal-for-trade variants
- Belt speed out of specified range
- Meter for varying belt angle
- Prefeeder control
- Special belt widths
- Special belt conveyors, please let us know.

### Ordering Data

For us to be able to handle your order smoothly and quickly, please let us have the data below in addition to the ordering number:

- Belt width [mm]
- Flow rate [t/h]
- Belt rise [%]
- Belt speed [m/s]
- Accuracy [%]
- Nominal flow rate ( )
- Actual flow rate ( )
### Multi-Idler Belt Weigher Variants

<table>
<thead>
<tr>
<th>Variant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP 500 - 2000</td>
<td>Belt weigher with weighing platform, IEC belt widths from 500 to 2000 mm</td>
</tr>
<tr>
<td>2 BMP 500 - 1400</td>
<td>Belt weigher with weighing platform, IEC belt widths from 500 to 1400 mm</td>
</tr>
<tr>
<td>BMC 500 - 2000</td>
<td>Belt weigher with weighing platform, IEC belt widths from 500 to 2000 mm</td>
</tr>
</tbody>
</table>

### Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGA 24 A</td>
<td>Speed measurement system, Namur switch with perforated disc</td>
</tr>
<tr>
<td>FGA 20 RSLE</td>
<td>Speed measurement system; friction wheel with rocker and support</td>
</tr>
<tr>
<td>FGA 20 RSLE-VA</td>
<td>Speed measurement system for belt speeds up to 3.5 m/s; friction wheel with rocker and support in stainless steel design</td>
</tr>
<tr>
<td>FGA 30 R2</td>
<td>Speed measurement system for belt speeds up to 3.5 m/s; friction wheel, enclosed casing, rocker and support</td>
</tr>
<tr>
<td>FGA 53 K</td>
<td>Speed measurement system for belt speeds from 3.5 m/s onward, with coupling for connection to shaft end</td>
</tr>
</tbody>
</table>
Speed Sensor  FGA 20RSLE

- Cost-efficient integration
- High reliability
- Maintenance-free storage and sealings
- Easy handling
- Completely made of galvanized steel or stainless steel
- Legal-for-trade variant for MULTIBELT®-type belt weighers
- ATEX optional category 2GD (zones 21, 22, 1 or 2)

Application
The FGA 20RSLE speed sensors are designed for measuring the belt speed of belt conveyor systems. They are used as optional equipment for MULTIBELT®-type belt weighers. A customized speed sensor can be used in ATEX zones 21, 22, 1 or 2.

Design
The speed sensor consists of a rocker that can be pivoted around an axis. The axis is mounted in a bracket that is attached to the machine (belt conveyor) to be monitored. The measuring wheel is attached to this rocker and runs slip-free on the belt to be measured. The belt speed is measured as a frequency signal through windows in the measuring wheel and with one or two (legal-for-trade) proximity sensor/s and processed using an evaluation device.

The FGA 20RSLE speed sensor is manufactured entirely of a highly corrosion-resistant galvanized steel and in the ATEX – certified model made of 1.4301 stainless steel.

Function
The pulse wheel runs on the interior of the empty, returning belt of a belt feeder system with a rubber ring. Under its own weight, the wheel is friction-locked against the belt and is made to rotate by the belt movement. The non-slip motion means that the wheel circumferential velocity corresponds to the belt speed.

The rotational speed of the wheel is registered by a sensor that records the speed by means of transmitting a signal through an alternating series of windows and bars, recording a frequency that corresponds to the belt speed of the belt conveyor system. This frequency is transmitted to the evaluation electronics where it is analyzed.
### Dimensions [mm]

![Dimensions Diagram]

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-20 °C … +50 °C</td>
</tr>
<tr>
<td>Operating temperature, ATEX</td>
<td>-20 °C … +50 °C</td>
</tr>
<tr>
<td>Belt speed</td>
<td>&lt; 3.5 m/s</td>
</tr>
<tr>
<td>Pulses</td>
<td>20 pulses per revolution</td>
</tr>
<tr>
<td></td>
<td>= 33.5 pulses per meter of belt</td>
</tr>
<tr>
<td>Output signal</td>
<td>Namur</td>
</tr>
<tr>
<td>Weight</td>
<td>4.55 kg</td>
</tr>
<tr>
<td>Legal-for-trade type</td>
<td>2 proximity sensors</td>
</tr>
<tr>
<td>ATEX (option)</td>
<td>Zone 21, 22, 1 or 2</td>
</tr>
</tbody>
</table>

### Installation of the FGA 20RSLE

![Installation Diagram]

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Speed Sensor FGA 30R2

Application

FGA 30R2 speed sensors are designed for measuring the belt speed of belt conveyor systems. They are used as optional equipment for MULTIBELT®-type belt weighers. A customized speed sensor can be used in ATEX zones 21, 22, 1 or 2.

Equipment

The speed sensor consists of a housing with an internal impulse wheel mounted on a drive shaft. The angular velocity of the shaft is measured as a frequency signal through windows in the measuring wheel and with one or two (legal-for-trade) proximity sensor/s and processed using an evaluation device.

The FGA 30R2 speed sensor is made entirely of steel with a powder-coated surface. The FGA 30R2 can be fitted with a rocker and a friction wheel for use as a friction wheel speedometer for registering the speed of the returning belt. Alternatively, with a coupling the FGA 30R2 can be run by e.g. the tail pulley of a belt feeder system.

Function

If operated as a friction wheel speedometer:

- The friction wheel runs on the interior of the empty, returning belt of a belt feeder system with a rubber ring.
- Under its own weight, the wheel is friction-locked against the belt and is made to rotate by the belt movement.
- The non-slip motion means that the wheel circumferential velocity corresponds to the belt speed. The rotational speed of the wheel is registered by a sensor that records the speed by means of transmitting a signal through an alternating series of windows and bars, recording a frequency that corresponds to the belt speed of the belt feeder system. This frequency is transmitted to the evaluation electronics where it is analyzed.

- High degree of reliability
- Robust design
- Maintenance-free storage and seals
- Made completely from steel
- Legal-for-trade variant for MULTIBELT-type belt weighers
- Designed for operation with friction wheel and rocker
- Drive system with coupling available
- Successor to the FGA 30R with identical connection dimensions
- ATEX optional category 2GD (Zone 21, 22, 1 or 2)
**Operational temperature**  
-25 °C ... +60 °C

**Operational temperature, ATEX**  
-25 °C ... +60 °C

**Belt speed**  
< 5 m/s

**Max. rotational speed**  
3000 min⁻¹

**Pulses**  
30 Pulses/revolution

**Output signal**  
Namur

**Weight**  
3.2 kg

**Standard design**  
1 Proximity sensor

**Legal for trade design**  
2 Proximity sensors

**ATEX (option)**  
Zone 21, 22, 1 or 2

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Correction system for Scales with variable Weigher Inclination

- Suited for any scales such as belt weighers
- Inclination correction: to ± 29°
- Robust structure, IP65

### Application
The inclination correction system VME 28061 is used for correcting the measuring signal of a weighing unit if the inclination is variable. It is preferred for use with belt weighers.

### Structure
The device measures the inclination electronically and in accordance with the inclination corrects the signal of the load cell. It is installed in an IP65 enclosure. The device is mounted at a location with the same inclination as the scale to be corrected. The system is roughly aligned at the scale. Fine tuning is done electronically.

### Function
An inclined scale only measures a weight of the mass to be measured that is reduced by the cosine of the angle. The VME 28061 corrects this fault on the electrical output of a strain gauge load cell. The correct functions are not depending upon the load cell model and number nor the design of the electronic measuring unit as long as the electronic supplies the load cell with max. 12 V.
### Uncorrected readings of inclined scales

<table>
<thead>
<tr>
<th>Inclination</th>
<th>Reading error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5°</td>
<td>-0.1%</td>
</tr>
<tr>
<td>5.0°</td>
<td>-0.4%</td>
</tr>
<tr>
<td>10.0°</td>
<td>-1.5%</td>
</tr>
<tr>
<td>15.0°</td>
<td>-3.4%</td>
</tr>
<tr>
<td>20.0°</td>
<td>-6.0%</td>
</tr>
</tbody>
</table>

Note:
If the scale inclines without a corrective mechanism this will falsify the dead load measurement. This also will cause absolute measuring errors when determining the payload.

### Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclination range</td>
<td>-29° ... +29° from the horizontal in exactly one plane of inclination</td>
</tr>
<tr>
<td>Residual correction error in the operating</td>
<td>&lt;0.05 % of the load cell measured reading</td>
</tr>
<tr>
<td>temperature range</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>18 ... 36 VDC (isolation is realised in the VME 28061)</td>
</tr>
<tr>
<td>Load cell supply voltage</td>
<td>12 Vpp AC or DC max.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-25 °C ... +60 °C (Avoid direct sunlight)</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-40 °C ... +80 °C</td>
</tr>
<tr>
<td>Signal wire cable cross-section</td>
<td>Max. 1.5 mm²</td>
</tr>
<tr>
<td>Supply voltage cable cross-section</td>
<td>Max. 2.5 mm²</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65</td>
</tr>
<tr>
<td>Dimensions W x H x D [mm] (cable inlets not</td>
<td>122 x 120 x 90</td>
</tr>
<tr>
<td>considered)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1500 g</td>
</tr>
<tr>
<td>Approbation</td>
<td>CE</td>
</tr>
</tbody>
</table>

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Recommendations for the Installation Planning of Belt Weighers

10 rules to ensure proper functioning and high accuracy

Strict observation of the following rules is essential with a view to minimizing factors which might adversely affect the functioning and measuring accuracy of the belt weigher, and which originate from the weigher environment.

For maximum accuracy (related to the actual value), rules 4, 5 and 9 are of particular importance. The measuring stations themselves are of rugged design, and resistant to torsion.

Detailed instructions for installation and alignment are given in our installation, calibration and commissioning instructions.